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ABSTRACT

The taxonomy adopted for use with projects operating under the auspices of the Florida Educational Research and Development Program embodies five primary categories: motor skills, verbal information, intellectual skills, cognitive strategies, and attitudes. Performance objectives are classified in terms of the learning process required for the accomplishment of the specified task. This classification can be accomplished by determining whether the end product of the specified performance is a demonstration of an ability to perform a defined physical action (motor skills); a demonstration of ability to recall a fact or a relationship (verbal information); a demonstration of an ability to distinguish between members of a class of objects (intellectual skills); a demonstration of an ability to classify objects as belonging to the same set (intellectual skill); a demonstration of an ability to identify or demonstrate a relationship between two or more concepts (intellectual skill); a demonstration of an ability to select and apply rules in a multi-stage operation (intellectual skills); an observable response from which an altered internal approach to learning can be inferred (cognitive strategies); or an observable response from which an inference about the learner's behavior-guiding principles can be made (attitudes). (RT)

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CLASSIFYING PERFORMANCE OBJECTIVES

The taxonomy adopted for use with projects operating under the auspices of the Florida Educational Research and Development Program embodies the structure proposed by Gagné (1971). A distinguishing characteristic of this taxonomy is the classification of performance objectives in terms of the learning process required for the accomplishment of the specified task. There are five primary categorizations, namely, (1) motor skills, (2) verbal information, (3) intellectual skills, (4) cognitive strategies, and (5) attitudes.

CATEGORIES

(1) Motor Skills: Capabilities necessary for organized motor performances such as printing letters, pronouncing letter sounds, and using tools and instruments. A performance objective in this domain would require that the learner demonstrate a defined physical action.

(2) Verbal Information: Possession of factual knowledge, such as basic addition facts, dates associated with a given event, and the rote reproduction of a definition. An objective in this category would require the recall of a fact, a principle, or a generalization.

(3) Intellectual Skills: Discrimination, concept learning, rule learning, and problem solving are skills included in this category. Discrimination requires that the learner distinguish between members of a set or class of similar objects or events. Con-

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cept learning requires the classification of objects or events as belonging to the same set or class. Rule learning requires the discovery or demonstration of the relationship between two or more concepts, and problem solving, the ability to select and apply rules in a multi-stage operation.

(4) Cognitive Strategies: Internally organized skills which govern the individual's behavior in learning. To be classified in this category the objective must have as its end product the planned alteration of a learner's internal approach to learning, thinking, or remembering.

(5) Attitudes: This domain involves the internalized principles or system of beliefs that guide the learner's behavior. Attitudinal objectives have as end products the modification of emotional response or mental set.

Given a sufficiently complex learning situation, a student will employ several of the processes described in the above categories. If, for example, the objective is that the student create a coherent summary description of an observed event, a reasonable test situation might require the student to describe in essay form the actions portrayed in a film. In typing or writing the essay, learned motor skills would be employed. Verbal information acquired would supply the necessary vocabulary, and intellectual skills such as the application of language rules governing sentence structure would be employed. Cognitive strategies would determine the organization of the task for accomplishment, and the degree of care employed in completing the task would be determined by attitude.

How then is one to classify this objective? The solution proposed here is to check the objective statement against criteria such as those provided in the following checklist.

IS THE PRIMARY END PRODUCT OF THE PERFORMANCE SPECIFIED IN THE OBJECTIVE:

A demonstration of an ability to perform a defined physical action? (Motor Skill)

Example: The student will type from a printed copy a three hundred word statement at a rate of not less than thirty words per minute and with not more than five errors.

Example: The student will cut a 1" x 8" board along a prescribed line using a standard hand saw so that the cut shall not be more than 1/16" from the line at any point on the surface.

A demonstration of an ability to recall a fact or a relationship? (Verbal information)

Example: Given a list of names of chemical compounds and a list of corresponding chemical symbols, the student will match name with symbol with 100 per cent accuracy.

Example: When asked to name the component elements of water the student will specify hydrogen and oxygen only.

A demonstration of an ability to distinguish between members of a set or class of (similar) objects or events? (Intellectual skill: Discrimination)

Example: Given the tape-recorded presentation of a series of pairs of musical notes the student will state, as each pair is presented, whether they are the same or different.

Example: Given visually presented pairs of block letters, the student will state whether the letters are the same or different.

A demonstration of an ability to classify objects or events as belonging to the same set or class? (Intellectual skill: Concept learning)

Example: When asked to identify the distinguishing characteristics of a quadrilateral the student definition will include the specification "has four sides."

Example: Given a tape recorded presentation of a musical composition the student will identify its rhythmic structure, e.g., waltz, polka, Bolero.

A demonstration of an ability to identify, demonstrate, or utilize a relationship between two or more concepts? (Intellectual skill: Rule learning)

Example: Given pairs of numbers having one, two, or three decimal places the student will, without performing the multiplicative operation, correctly indicate the number of decimal places that should appear in the respective products.

Example: Given a straight line graph the student will interpret the depicted relationship between two variables by stating the effect on the value of one variable resulting from a change in the value of the other.

A demonstration of an ability to select and apply rules in a multi-stage operation in order to produce a personally novel product? (Intellectual skills: Problem solving)

Example: Given a television set in which three functioning parts have been replaced with defective parts, a circuit diagram of the set, and all necessary tools, the student will, within a two-hour period, identify and replace the three defective parts.

Example: Given a chemical compound and all necessary equipment for analysis, the student will determine the constituent elements of the compound.

An observable response from which an altered internal approach to learning or thinking can be inferred? (Cognitive strategies)

Example: Immediately following a two-minute examination of an unfamiliar three thousand word document the student will select from a list of ten statements the four that reiterate the principal ideas presented in the document.

NOTE. The inference is that the student has used a rapid scanning technique to identify the major points presented in the reading material.

Example: Given a list of pairs of two or three digit whole numbers and four possible products for each pair, and the information that one of the four responses is correct, the student will, within a ten second limit for each pair, and without using writing materials, select the correct response.

NOTE. The inference is that the learner has used an elimination technique (based on the "fit" of product terminal digit and/or on expected size of products) to select the correct response.

An observable response from which an inference about the learner's internalized behavior-guiding principles or system of beliefs can be made? (Attitude)

Example: Given a list of twenty statements, half of which favor acceptance of individual differences between humans and half do not, the student will indicate agreement with statements favoring acceptance and disagreement with those that do not to the extent that eighty per cent of the responses endorse acceptance.

Example: Given the opportunity on six distinct occasions to choose between a reading activity and other in-class activities, the student will choose to read on at least four of the six occasions.

Commentary

The following factors should be carefully considered by those constructing or classifying objectives:

(1) A change in classification substitutes, in effect, a different objective for the original. Consider the following "concept learning" objective.

When asked to define "inertia" the student will respond to the effect that inertia is the tendency of an object to main-

tain a constant rate and direction of movement unless influenced by some external force.

In classifying this objective as "concept learning" the writer agrees that if the individual can define the term, he understands the concept "inertia". If the objective were classified as "verbal information" the only legitimate conclusion to be drawn from the accomplishment of the objective would be that the student had demonstrated his ability to recall the definition of the term.

(2) The category to which an objective is assigned will, or should, influence the selection of the processes used in providing instruction. In the case cited in (1), giving a student a printed statement defining inertia and requiring memorization would probably be inappropriate. Such a process would be feasible (but not necessarily desirable) if recall were the expected product.

(3) The experiental background of the student must be considered in assigning objectives to categories. For example, the solution of a multi-digit multiplication problem may require "problem solving" skill from a third grade student, but serve only as evidence of "rule learning" at later stages of student development. This is not to suggest that the objective be reclassified to accomodate student level but rather that the selection of objectives be keyed to student prior attainments. The implications of this factor for those engaged in remedial instruction should be readily apparent.

Procedural Suggestions

Ideally the learning process required for the accomplishment of an objective should be identified by objective and item developers prior to or during the writing process. The writer may ask the following questions:

1. Does the performance require a motor, cognitive, or attitudinal response from the learner?
2. If cognitive, is the learner to (a) recall information, (b) discover or state that two objects or events are dissimilar, (c) demonstrate understanding of a concept, (d) discover or demonstrate the relationship between concepts, (e) select and employ rules for the solution of a problem, or (f) give evidence of a modified internal approach to learning?

Once a decision regarding the desired learning process has been made the writer is in a better position to specify a task, the accomplishment of which is to be accepted as evidence of the class of learning performed.

The classification of previously written objectives is somewhat more difficult because the writer's intent is not always readily apparent. Question 1 above is again pertinent in this situation. If the primary end product is identified as motor or attitudinal no further action is required. When a determination of cognitive status is made the problem becomes more complex. However, because the cognitive skills constitute at least a partially ordered hierarchy, the classifier can, by a process of

elimination, simplify the task. By beginning with cognitive strategies and reversing through problem solving, rule learning, concept learning, and discrimination to verbal information, the classification can be quickly approximated. The decision will then be between at most two hierarchically adjacent categories.

The best and most reliable results would probably be achieved by cooperative effort involving two- or three-member teams, with individual members independently classifying objectives and subsequently reaching agreement where different classifications have been proposed. In cases where the classification is readily apparent, of course, this extended process will be unnecessary.

References

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